2009 University of Wisconsin Research Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

Operating Philosophy/Program Overview

The Wisconsin Experiment Station is committed to the concept of investigator-driven and peer-reviewed research activities. The general philosophy in allocating formula funds is to provide support for specific reviewed projects rather than to distribute block amounts to faculty or departments. At the University of Wisconsin, faculty appointments are funded with state appropriations, thus releasing nearly all formula funding for project support. Expenditures are allowed under a series of guidelines reviewed annually by a faculty committee. Matching funds come primarily from state support of salaries for investigators and research staff.

This process has worked very well during periods of stable funding. However, with significant increases in Formula Funding occurring mid-year for FY 2007, we carried over funds into FY 2008. Some of these funds were allocated during FY 2007 using the competitive process to the extent possible, but a significant allocation was made administratively based on the stakeholder input processes described and on national and state priorities. Progress and accomplishments will be reported in our FY 2007 and FY 2008 annual Reports of Work. We expect our allocation for FY 2008 to be administered as described in this document, but some carryover is expected although significantly less than in FY 2007. We do expect to again allocate a small percentage of our funds administratively based on emerging or critical issues.

Formula funds are distributed to approved projects with yearly budgets. Normally, approximately 160 projects are funded with formula funds each year with budgets that include personnel (mainly graduate students) and supplies. Funding of capital equipment items, some of which may be shared by several projects, are prioritized by departments and funded in a separate exercise. Travel to multi-state research meetings is provided for the official representative from a central pool of funds.

The Research Program in this Plan of Work is composed of a number of projects with individual review and reporting. Program duration may be extended for multiple years, but the contributing projects are a constantly shifting portfolio that can be quickly redirected. Projects are approved for periods of one to five years with the majority on a four-year cycle. Proposals for new projects require a discussion of the results from previous formula fund support which is used as part of the criteria for ranking proposals and for evaluating the ability of the team to complete the research project successfully. Although some multi-state projects have been continuing for more than 10 years, revised proposals are required for review and approval at least every 5 years. Each year, approximately 20% of the research portfolio is shifted in new directions.

This process of continual re-examination of our portfolio allows us to address short-term, intermediate term and long-term issues. A small number of approved projects may be started at mid-year as new faculty members are hired or emerging problems trigger an early start at the discretion of the Director of Agricultural Programs, WAES, and the Associate Dean for Research. These processes ensure that projects are pertinent to the REE and CSREES national goals and emphasis areas and focus on current state research needs.

The process follows a general “logic model” process in which input is sought from stakeholders, establishing a set of operating priorities. Stakeholder groups include both traditional and non-traditional groups. Input is also sought via public meetings such as field day events held at our Agricultural Research Stations or through other Extension venues including meetings and a set of Extension issue-based teams composed of University of Wisconsin – Madison/Extension faculty and county based educators.

Five national goals have been established in the Research, Education, and Economics (REE) Mission Area and USDA Cooperative State Research, Education and Extension Service (CSREES) Agency strategic plans. (http://www.csrees.usda.gov/business/reporting/portfolios.html)

These goals are listed as priorities for projects to be funded in the Wisconsin Research program. The number of current Wisconsin projects is included for each goal in parentheses. In using the nationally devised goals and themes as the reporting framework, it also should be noted that research projects frequently do not fit neatly and exclusively into one and only one category. In many instances, a research project relates to multiple goals and themes. These research projects are then reported in multiple goals. Research projects; like the agricultural, natural resource, and community issues they address; are frequently at the intersecting points of disciplines and interests. We view this interdisciplinary nature of our research efforts as a strength.

1. Enhance Economic Opportunities for Agricultural Producers. Empower families and communities to address the economic and social challenges through research-based information and education.

2. Support Increased Economic Opportunities and Improved Quality of Life in Rural America. Enhance environmental quality through better understanding of, and building on, agriculture and forestry’s complex links with soil, water, air and biotic resources.

3. Enhance Protection and Safety of the Nation's Agriculture and Food Supply. Ensure a safe and adequate food and fiber supply through improved science-based detection, surveillance, prevention, and education.

4. Improve the Nation's Nutrition and Health. Enable people to make health-promoting dietary choices through nutrition education, research, and development of more nutritious foods.

5. Protect and Enhance the Nation's Natural Resource Base and Environment. Empower the agricultural system with knowledge to improve competitiveness in domestic production, processing, and marketing through research and education.

Within these national goals, states are asked to draw on stakeholder input to help direct use of formula funding. In Wisconsin, College administration and faculty meet regularly with a number of college and departmental advisory groups, commodity organizations, state agencies, consumer groups, and private citizens. Input from these stakeholders, and from those performing the research, is beneficial to assist in highlighting areas of research need. Department chairs are also asked to provide a small number of research topics from each unit of CALS for use in Hatch and McIntire-Stennis call for proposals. Input from stakeholders is reviewed and discussed periodically as information is obtained at regularly scheduled meetings of the CALS administrative team. The following is a compilation of common themes established as the result of these discussions, reviews and updates by College administration. The list below is provided to draw attention to needs currently of interest within the state, and is published annually as part of the Colleges call for proposals for our Hatch Research program.

1. Mechanisms of pest and pathogen resistance and safe and effective control, with minimum effects on environmental quality and human health.

2. Effects of change in global climate, population pressures, or public policy on agricultural production, environmental resources, ecosystem management, and future land uses.

3. Identification of socioeconomic or other forces that shape the viability of Wisconsin industries and employment including agriculture, bio-based industry, forestry, wildlife management, recreation, and other land uses.

4. Research on food safety, nutritional health, environmental protection, and biotechnology and on providing information on dietary choices, lifestyle and community decisions.

5. Sustainable agricultural and forestry production and processing systems that provide improved food safety and security, environmental protection, economically viable communities, protection of public goods, and human well-being. This need requires an understanding of basic life processes in order to manage biotic systems for human use.

These Wisconsin priorities along with the National Goals are provided to faculty to use in developing proposals for funding under the Hatch program. They are also provided to the review panel that provides recommendations for funding. We feel that there is a strong relationship between the national goals and Wisconsin priorities. For example, the first National goal (Enhance Economic Opportunities for Agricultural Producers. Empower families and communities to address the economic and social challenges through research-based information and education.) is clearly related to a number of the Wisconsin priorities including:

1. Mechanisms of pest and pathogen resistance and safe and effective control, with minimum effects on environmental quality and human health.

2. Effects of change in global climate, population pressures, or public policy on agricultural production, environmental resources, ecosystem management, and future land uses.

3. Identification of socioeconomic or other forces that shape the viability of Wisconsin industries and employment including agriculture, bio-based industry, forestry, wildlife management, recreation, and other land uses.

5. Sustainable agricultural and forestry production and processing systems that provide improved food safety and security, environmental protection, economically viable communities, protection of public goods, and human well-being. This need requires an understanding of basic life processes in order to manage biotic systems for human use.

Looking at the fourth National Goal, (Improve the Nation's Nutrition and Health. Enable people to make health-promoting dietary choices through nutrition education, research, and development of more nutritious foods.), the following Wisconsin goals relate:

1. Mechanisms of pest and pathogen resistance and safe and effective control, with minimum effects on environmental quality and human health.

4. Research on food safety, nutritional health, environmental protection, and biotechnology and on providing information on dietary choices, lifestyle and community decisions.

5. Sustainable agricultural and forestry production and processing systems that provide improved food safety and security, environmental protection, economically viable communities, protection of public goods, and human well-being. This need requires an understanding of basic life processes in order to manage biotic systems for human use.

Similar relevance can be cited for each national goal: Goal 2, Support Increased Economic Opportunities and Improved Quality of Life in Rural America, is aligned with Wisconsin priorities 2, 3 and 5. Federal Goal 3, Enhance Protection and Safety of

the Nation's Agriculture and Food Supply, relates to Wisconsin priorities 1 and 4. Federal Goal 5, Protect and Enhance the Nation's Natural Resource Base and Environment, is supported by Wisconsin priorities is supported by all of the Wisconsin priorities.

These priorities along with other criteria such as Extension/Integrated activity, Multistate, under-represented populations/groups and past Hatch productivity are also used in the merit evaluation of proposals subsequently submitted.

The call for proposals for a fiscal year (for example FY09) beginning Oct. 1, 2008, was initiated in June, 2007, approximately 16 months prior to project initiation. Proposals were due September 14, 2007. A copy of the call for proposals, guidelines and merit criteria are available at http://www.cals.wisc.edu/research/WAES/Hatch/.

Proposals are evaluated by an internal panel of faculty, called the Research Advisory Committee (RAC). The RAC is composed of 12 faculty, the Executive Director of the Agricultural Experiment Station and the Associate Dean(s) for Research. Faculty are chosen to represent the broad cross section of the college and serve rotating three year terms. Proposals are assigned to primary and secondary reviewers from the RAC members and two other appropriate scientific reviewers not on the RAC. These reviewers may be either internal, external or a mix. The criteria for choosing the reviewers would be their ability/knowledge base to judge the merit of the proposals. The RAC will then convene in late November or early December to rank the proposals based on the established criteria.

This process is detailed under "Nature of the Proposal reviews for Hatch and McIntire-Stennis Proposals" included at the end of the Call for Proposals document referenced above.

Outcomes being monitored initially to assess program effectiveness and impact including publications, patents and graduate students trained. Future indicators may be expanded to include other criteria. This information will not only be used to assess current program effectiveness and accomplishments, but will also be used as a consideration in determining future HATCH funding priorities.

CALS feels that Wisconsin accomplishments relate very well to high priority issues cited earlier. Publications in refereed journals, books, and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. UW-Madison CALS was rated first among peer institution in the Scientific Impact Factor of its publications. We feel this is representative of our entire research portfolio including Hatch. Hatch funding of research often leads to significant funding from other sources. CALS rates also very high in extramural funding both among land-grant and public institutions. A number of representative projects are reported as impacts in our Annual Report. Several representative examples of projects and their impacts are cited from CALS' 2007 annual report as follows:

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ldquo;Durable Resistance to Common Rust in Sweet Corn, Genetics and Breeding of Vegetative Phase Change and Adult Plant Resistance"

Impact Nugget: Breeding sweet corn to have long-lasting resistance to common rust will save farmers money and protect the environment.

Issue (who cares and why): Common rust is the most serious sweet corn disease in Wisconsin today, where more than 100,000 acres of the crop are grown. Depending on the season and the chemical fungicide used, farmers spend between $25 and $75 per acre each year to minimize the impact of the disease. Before 1999, farmers were growing sweet corn varieties that were resistant to common rust due to a single gene that protected the crop. However, in 1999, the fungus mutated so that the single-gene protection no longer worked. A corn crop with multiple-gene resistance to common rust would give Wisconsin's sweet corn crop long-lasting protection from the effects of this disease, saving farmers money and reducing the impact of fungicides on the environment.

What's been done: University of Wisconsin-Madison researchers gathered corn varieties from around the world that display multiple-gene resistance to common rust. Because these exotic strains are not adapted to temperate climates, the researchers crossed them with Wisconsin sweet corn varieties, and selected for increased disease resistance and important quality factors, such as flavor and texture. Already, they have isolated several new hybrids resistant to common rust, and agricultural companies are testing their marketability to consumers. In another research vein, the scientists are breeding for sweet corn with fewer juvenile leaves, which are more susceptible to common rust than adult leaves. They have already developed sweet corn plants with 20 percent fewer juvenile leaves.

Impact: The new sweet corn varieties developed through this research project are expected to exhibit long-lasting protection against common rust and save farmers between $25 and $75 per acre each year on fungicides. Reduced fungicide use will also benefit the environment. In addition to providing the new seeds to agricultural companies for testing, the findings from this study have been shared with the broader agricultural and research community at three conferences and through three journal articles.

Funding: Wisconsin Hatch project #WIS01020

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Knowledge Area(s): 201, 202, and 212

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ldquo;Identifying Potentially Anticarcinogenic Components in Common Vegetables”

Impact Nugget: Identifying healthful compounds in common vegetable crops will encourage consumers to eat more vegetables, thereby improving public health and supporting agriculture.

Issue (who cares and why): Although there have been multiple national-level efforts to encourage the general public to eat more vegetables (and fruits), including the “five-a-day” campaign, many Americans do not consume enough of these healthful foods. However, when a specific health-promoting compound is linked to a particular vegetable or fruit, as when broccoli was shown to contain sulforaphane (an anti-cancer compound) in the 1990s, consumption can increase dramatically. So, to encourage the public to include more vegetables in their diets, it is important to identify and promote healthful compounds in vegetables, as well as the specific health benefits that they confer to humans.

What’s been done: University of Wisconsin-Madison researchers have analyzed common crop plants for healthful compounds, in particular, those with potential to reduce cancer risk. So far, the researchers have identified ten different compounds with anti-cancer activities in green onions. They have also isolated compounds (or groups of compounds that work together) that have potential anti-cancer activities in red beet root and maize. The findings have been shared in three journal articles, at five symposia and with a group of food industry representatives at an annual meeting at UW-Madison.

Impact: The discovery of health-promoting compounds in crops will encourage consumers to eat more vegetables. This, in turn, will improve the health of Americans and help curb rising health care costs. Once these compounds are known, crop breeders can develop plants—via traditional breeding or genetic engineering—with increased levels of these compounds. Also, food processors can adjust their methods to preserve these components during processing.

Funding: Hatch project #WIS04787

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Knowledge Area(s): 501 and 702

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“Reducing Phosphorus Concentration in Lactating Dairy Diets Based On By-Products of the Corn Distilling Industry”

Impact Nugget: To ensure a robust market for distiller’s grains and solubles (a major by-product of corn ethanol production) as a dairy cattle feed, it is important to find ways to remove phosphorus from the feed or to mix it with low-phosphorus feeds in a way that optimizes milk production and protects the environment.

Issue (who cares and why): Thanks to the recent growth in corn ethanol production in Wisconsin, dairy producers have access to a low cost, high quality source of feed known as distiller’s grains and solubles. DGS are a major by-product of ethanol production; for every bushel of corn processed, approximately one-third ends up as feed. DGS contain high levels of protein, an important macronutrient in the dairy ration. Unfortunately, DGS also contain high levels of phosphorus, an element that ends up in manure and then ultimately in groundwater, where it negatively affects water quality. Since dairy farmers are required to manage phosphorus levels on their land, DGS is not an overly attractive option; the way things are now, feeding DGS at an economically attractive level consistent with high milk production makes meeting environmental considerations for good manure management more difficult and expensive.

What’s been done: This study seeks to maximize the use of DGS while minimizing its negative environmental impact using two different approaches: (1) mixing normal DGS with low-phosphorus feeds to create an optimal dairy ration and (2) using chemical or milling processes to reduce the amount of phosphorus in DGS. In one study, University of Wisconsin-Madison researchers performed a feeding trial and found that high levels of DGS—up to 18 percent—supported very good levels of milk production and quality. However, phosphorus levels were too high in all cases, underscoring the need to remove phosphorus from DGS before feeding it to cattle. In a second study, researchers developed a method to remove 85 percent of the phosphorus from distiller’s solubles, one of two by-product streams that are combined and sold as DGS. Distiller’s solubles contain the vast majority of phosphorus that ends up in DGS. In the future, distiller’s grains—the other, lower-phosphorus part of DGS—may be sold as feed on its own. However, this isn’t likely to happen until another use can be found for distiller’s solubles.

Impact: Findings from this project will help ensure that the corn ethanol industry has customers for its DGS by-product, while simultaneously guiding dairy producers and their nutrition advisors in the use of DGS to achieve maximum milk yields while maintaining environmentally-sound feeding practices. Results have been presented to producers through educational seminars and direct contact, and the dairy media have published multiple articles based on these findings. Thanks to this work, dairy producers are becoming more aware of the variability of DGS from different ethanol plants, and plants are being encouraged to better identify the contents of their DGS.

Funding: Hatch project #WIS05239

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Knowledge Area(s): 302 and 403

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ldquo;Identificaiton of West Nile Virus Mosquito Vectors in Southern Wisconsin”

Impact Nugget: Understanding how mosquitoes transmit the West Nile virus to humans in Wisconsin will lead to better control measures and help reduce infections in the area.

Issue (who cares and why): Although it is believed to mainly cycle between birds and mosquitoes, humans can become infected with West Nile virus (WNV) if they get bit by mosquitoes carrying the virus. While most people infected with the virus do not become ill, about 20 percent experience flu-like symptoms and one percent become severely ill. There is no vaccine or specific treatment. The WNV first showed up in the United States in 1999, and now it is endemic throughout the nation. In Wisconsin, the virus was first found in wild birds in 2001, and then in humans in 2002. In a typical year, Wisconsin has 10-20 reported cases, including a few fatalities. To reduce the number of illnesses and deaths caused by WNV, researchers need to figure out how mosquitoes are transmitting the virus to humans so that control measures can be deployed effectively.

What’s been done: In 2006 and 2007, a team of University of Wisconsin-Madison researchers sampled more than 350 sites in Southwest Wisconsin where mosquitoes are likely to breed. At each site, they compared two mosquito-trapping methods: the standard “light and carbon dioxide” trap used by the local government to monitor WNV and the “human trap,” where mosquitoes alight on a patch of exposed human skin before being captured. They discovered that mosquitoes caught in the standard trap don’t reflect the true population of mosquitoes that bite humans. Specifically, the standard trap captured a high proportion of Culex pipiens, the mosquito widely believed to be the nation’s major WNV vector. However, using the human trap method, very few Culex pipiens were captured. Interestingly, of the 600 Culex pipiens captured during the course of this research, very few had WNV. Together, these results suggest Culex pipiens may not be the cause of human WNV infections in Wisconsin. In the 2008 season, the researchers will consider other culprits: Wisconsin’s two most abundant mosquito species. The research also clearly shows that man-made water features—ditches, retention ponds, etc.—are the most productive mosquito breeding sites.

Impact: This project will ultimately reveal the mosquito responsible for transmitting West Nile virus to humans in Southwest Wisconsin, information that will help municipalities better monitor and control the virus. The region’s current control strategy, for one, may need to be changed if Culex pipiens turns out not to be the main WNV vector in the area. With guidance from Wisconsin’s Department of Natural Resources, the team is now assessing the ability of Fat-headed minnows, a native Wisconsin fish, to control mosquito populations in ditches and retention ponds. They are also collaborating with the National Wildlife Health Laboratory to help identify WNV in mammals, and with Dane County’s Public Health Department to identify mosquito larvae species collected from monitoring sites. This work has been published in one scientific journal, with more articles to come, and the team plans to work with Dane County neighborhood associations to share their main findings with the public. Tangentially, an invasive mosquito called Ochlerotatus (Aedes) japonicus was discovered in Wisconsin for the first time during sampling for this project. This mosquito is a vector of WNV in other parts of the U.S.

Funding: Hatch project #WIS04968

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Knowledge Area(s): 721

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ldquo;The Trojan Horse and the Gypsy Moth: Harnessing Killer Plasmids for Targeted Study of Microbial Communities”

Impact Nugget: Understanding the gypsy moth’s microbial gut community will lead to improved insecticides better able to protect North American forests from this devastating insect pest.

Issue (who cares and why): The gypsy moth is a significant threat to natural and managed forests in North America. First released into the wild near Boston in 1869, this invasive specie is well established in the northeast, and has been slowly and steadily spreading to the west and south. Wisconsin is currently situated on the expanding front of the moth’s range. During outbreaks, gypsy moths cause damage throughout their range. In Wisconsin, for example, gypsy moth larvae defoliated around 65,000 acres in 2003 and 23,000 acres in 2007, according to the Wisconsin Department of Natural Resources. Currently, the most common way to kill gypsy moth larvae is by spraying infested trees with a bacterium known as Bacillus thuringiensis, or Bt. However, Bt doesn’t always work as well as could be hoped and this pest continues to spread.

What’s been done: By studying the gut flora of gypsy moth larvae, University of Wisconsin-Madison researchers overturned a long-held theory explaining how Bt works to kill insects, and revealed a new strategy for combating insect pests. For decades, scientists believed that Bt directly caused death by growing in the insect hemolymph (blood) and causing the insect equivalent of blood poisoning. Instead, the UW-Madison team found that Bt works in concert with a common gut bacterium called Enterobacter to stimulate a fatal response.

Impact: This research will lead to improved insecticide formulations that are better able to kill gypsy moths and other insect

pests. For example, these findings immediately suggest one possible new control strategy: an insecticidal spray made up of Bt and Enterobacter. The researchers have also found other bacteria and chemical compounds that boost Bt's insecticidal potency, and they are in the process of developing ones cheap enough for widespread use.

Funding: Hatch project #WIS05234

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Knowledge Area(s): 123, 211

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ldquo;Identification of Genes Unique to Highly Pathogenic Erwinia Carotovora Subsp. Carotovora"

Impact Nugget: Control measures are desperately needed to combat Erwinia, the group of bacteria that causes soft rot and other major potato diseases.

Issue (who care and why): Erwinia is the causal agent of economically important potato diseases, including stem rot, soft rot and black leg. On a bad year, experts speculate that these and other closely related diseases can destroy up to 20 percent of the nation's potato crop as it sits in storage. Erwinia species also damage other vegetable and ornamental crops. At present, there are no effective chemical control methods for the field, the greenhouse or the storage locker. Losses are so severe that the Wisconsin Potato and Vegetable Growers Association built a $2.9 million potato storage research facility, and then donated it to the UW-Madison in 2006.

What has been done: A team of University of Wisconsin-Madison researchers is studying Erwinia, searching for the most potent disease-causing genes and their corresponding proteins. To better understand the evolution of these genes, the team is collaborating with another group to determine how the soft rot Erwinia are related to each other, and to other plant and animal bacteria. This work has resulted in the discovery that four different soft rot Erwinia species, which use overlapping but distinct sets of virulence genes, infect vegetables and ornamentals in the United States. At the same time, the team is looking for antimicrobial agents capable of neutralizing the most virulent Erwinia strains. Because plant assays to examine virulence are very time consuming, researchers have been searching for faster methods of assaying virulence protein functions. The team discovered that an important set of virulence genes is required to form a special type of biofilm called a pellicle. Based on this discovery, they developed a novel assay—both fast and inexpensive— that can be used to screen a "library" of chemicals for ones that could function as antimicrobials against Erwinia and other plant pathogens.

Impact: This work has confirmed a number of suspected virulence genes and revealed a number of new ones, whose corresponding proteins would make good targets for antimicrobial chemicals. Also, using the novel assay they developed, the UW-Madison team has discovered a handful of chemicals that appear to mitigate the activity of Erwinia virulence genes. If proven to work outside the lab, these chemicals would be among the first-ever chemical means to control soft rot diseases. This project has attracted the attention of other funding agencies, receiving $1.9 million from the National Science Foundation, as well as a $300,000 National Research Institute grant. This work will also play a critical role in the effort to develop an Erwinia gene chip, a powerful biotechnology tool that allows researchers to quickly "test" the response of every gene in the Erwinia genome to different conditions.

Funding: Hatch project #WIS04767

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Knowledge Area(s): 211

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ldquo;Using Stage-Based Interventions to Increase Fruit and Vegetable Intake in Young Adults"

Impact Nugget: New strategies are needed to motivate young adults to eat more fruits and vegetables

Issue (who cares and why): In general, Americans don't eat the volume and variety of fruits and vegetables that they should. This is especially true of young adults, a group that is establishing life-long habits that they will soon pass on to their children. Studies show that a mere approximately 20 percent of young adults eat five or more fruits or vegetables per day, with a good portion of servings coming from French fries and tomato sauce (on pizza). The most recent federal guidelines recommend eating nine or more servings per day, a target designed to help prevent chronic disease. If young adults could be convinced to eat more fruits and vegetables, this group would lower their risk for heart disease and some cancers.

What has been done: As part of a multi-state project led by a University of Wisconsin-Madison nutrition professor, researchers developed, pilot-tested and then implemented a nutritional intervention designed to increase fruit and vegetable consumption among young adults. During the six month intervention, 1000 subjects received a suite of materials—a magazine, four newsletters, two individualized nutrition reports and two educational phone calls—that were tailored to each subject's readiness to increase their consumption of fruits and vegetables. The study also included 1000 control subjects who received a single newsletter containing standard, non-tailored nutritional messages. The team found that the intervention had a modest, but

significant, effect. The group that received the intervention increased their consumption of fruits and vegetables more than the control group. The effect was a lasting one; six months after the intervention, this group ate 0.4 more servings per person per day than the control group. This seemingly small increase adds up to over 100 extra servings of fruits and vegetables each year.

Impact: This project led to the development of a successful behavior-change intervention to encourage young adults to eat more fruits and vegetables. A web-based version of the program is available online, in both English and Spanish, and was selected to be included on the federal Food Stamp Connections website, a clearinghouse for the nation's best nutrition education materials. The researchers published a paper describing the intervention and how it can serve as a model for other community education programs. Already, Extension educators have developed a similar program called "Vary Your Veggies" for Wisconsin's Special Supplemental Nutrition Program for Women, Infants and Children. Other aspects of the project have been shared through numerous articles, abstracts and talks at conferences and meetings. The project helped researchers secure an NRI grant to push this line of research in new directions.

Funding: Hatch project #WIS03967

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Knowledge Area(s): 703

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ldquo;Using Milk Urea Nitrogen (MUN) as an Indicator of Energy and Nitrogen Balance in Early Lactation Dairy Cows to Improve Management of Health"

Key themes and focus areas: A new method of determining negative energy balances may be an easy, cost-effective way for farmers to identify metabolic disorders and evaluate dairy herd health in early lactating cows.

Issue (who cares and why): Known by many as America's dairy land, Wisconsin consistently tops national charts for milk and cheese production: In 2006 the state's 1.24 million dairy cows produced more than 23 billion pounds of milk (roughly 18,824 pounds of milk per cow), which aided in the state's production of 2.47 billion pounds of cheese. Making all of this milk can be hard on a cow's body. If the animal doesn't consume enough nutrients to create the milk, she will begin to metabolize her own body reserves of fat (and sometimes muscle), which can lead to a "negative energy balance." Studies have long associated these negative energy balances in early lactation with metabolic disorders which can lead to significant economic impacts. In 2003, these metabolic disorders (in early lactating cows) cost the Wisconsin dairy industry more than $1.0 million. Presently, farmers lack an affordable method of easily identifying negative energy balances in their early lactating cows. The current procedure—testing for non-esterified fatty acids (NEFA) in blood—to identify metabolic disorders is costly. At roughly $9.50 per test, farmers often wait until a cow appears ill before ordering such a test. Early detection of negative energy balances would lower costs for producers while also improving animal welfare and overall dairy herd management.

What's been done: Researchers at the University of Wisconsin-Madison studied the feasibility of using information about Milk Urea Nitrogen (MUN) levels and other data (such as milk production and changes in body weight) as a less expensive proxy for the "gold standard" NEFA test. MUN levels, which have been associated with negative energy balances, can be determined non-invasively with equipment already used by Dairy Herd Improvement technicians who visit dairy farms on a regular basis. Measuring MUN levels is also inexpensive, running about $0.20 per test. To assess their idea, the research team housed 60 cows from the US Dairy Forage Research Center in a tie stall barn for 5 weeks (2 weeks prior to calving, and 3 weeks post-partum). Because many factors might contribute to negative energy balances, the research team sampled the animals' feed, blood, milk, milk fat and colostrum, and monitored consumption of feed. The researchers found that high initial peaks of MUN seem to be associated with negative energy balance, indicating that MUN (combined with other data such as milk production) can serve as a reliable predictor of negative energy balances in early lactating cows. While the MUN test looks promising, the researchers highlight several key challenges that remain: the low concentrations of milk urea nitrogen, the myriad factors which influence urea which may not yet be fully understood and the way in which milk urea nitrogen is presently analyzed (on many farms, MUN is evaluated for the entire herd instead of for individual cows).

Impact: These findings indicate that farmers may soon have an affordable method for the early detection of negative energy balances in early lactating cows. Using milk urea nitrogen combined with other indicators (such as milk production and changes in body weight) dairy farmers may soon be able to perform regular, non-invasive tests to improve overall herd welfare by effectively identifying animals with negative energy balances at early stages. At roughly $0.20 per test, this would be an inexpensive tool to help monitor herds for costly metabolic disorders.

Funding: Hatch project #WIS01095

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Knowledge Area(s): 302 and 305

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Historically the University of Wisconsin-Extension and the University of Wisconsin-Madison, College of Agricultural and Life

Sciences have submitted separate plans and reports. While this remains the case with this plan, the intent on the part of both institutions is to improve the linkage of the plans in areas such as stakeholder and research input, evaluation of integrated activity, and outcome evaluation. This may lead to submission of a single plan for the State of Wisconsin in the future.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2009	0.0	0.0	156.0	0.0
2010	0.0	0.0	154.0	0.0
2011	0.0	0.0	154.0	0.0
2012	0.0	0.0	154.0	0.0
2013	0.0	0.0	154.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- Expert Peer Review

2. Brief Explanation

Proposals for Hatch funding on the UW-Madison campus are reviewed by a 12 person faculty committee. This committee, the Research Advisory committee, is appointed by the Wisconsin Agriculture Experiment Station Executive Director. Agricultural Programs Director Richard J. Straub currently serves in this role. Each proposal receives two reviews from the panel members (designated primary and secondary reviewers) and two reviews from outside the committee using established experts in the field from the Madison campus, other UW campuses, WI state agencies, non-governmental organizations and from scientists from other states. Panel reviews are discussed by a primary and secondary reviewer from the campus committee and the entire group ranks the proposals using three criteria that include merit, quality of science and ability of the researchers to complete the project.

Merit includes relevance to program guidelines and to National Goals and Emphases Areas, pertinence to state problems and priorities, relationship to multistate projects and inclusion of integrated activity.

Recommendations of the Research Advisory Committee are used by the Executive Director of the Wisconsin Agriculture Experiment Station and the Associate Dean for Research to make funding and programmatic decisions.

Multi-state efforts are peer-reviewed by the regional committees in the North Central region using a several stage

process. Committees of departmental chairs and heads from pertinent departments review the proposals and make recommendations to the subcommittee of the North Central Region Administrators (NCRA) Committee.

Some Wisconsin faculty are also cooperators in multi-state committees in the Northeast Region, Southern Region, Western Region and a few National (NRSP) projects. Each region has a review process with slight modifications. Details on North Central projects, guidelines, review process and links to other regions are available online at http://www.wisc.edu/ncra/.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

The planned program relies on annual input from stakeholder groups to identify critical issues of strategic importance. These priorities are conveyed to faculty who competitively apply for project support from Hatch funds (along with national goals which have been established in the Research, Educators, and Economics (REE) Mission Area and the USDA Cooperation States Research Educators and Extension Service (CSREES) strategic plans). These priorities are also used by the Research Advisory Committee that evaluates the project proposals as described in the Merit Review section. These goals are then used by the Wisconsin AES Executive Director in consultation with the Associate Dean for Research in making final program funding decisions.

A small pool of Hatch funds (5-10% of total) are not allocated through the competitive process, but are used to meet any urgent critical needs which arise outside of the normal funding cycle. Usually about one half of this pool is ultimately used to provide capital support to ongoing projects. This amount will vary based upon the number of emerging issues needing attention.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

The University of Wisconsin–Madison campus is actively engaged in promoting a diversity initiative, Plan 2008 (see http://www.provost.wisc.edu/plan2008) charged to increase diversity of our students, staff and faculty and to create an awareness and understanding of diversity issues among our population. This plan is currently under review and redirection. A National Science Foundation funded program has promoted inclusion of more women in under-represented sciences. The College of Agriculture and Life Sciences has developed a memorandum of understanding with the Menominee Nation that is bringing college and pre-college students to both campuses for reciprocal visits and education.

We are using such broad based programs to promote awareness of needs of the under-served community. Many societal needs such as those related to health, nutrition and economic development often affect the under-served and under-represented disproportionately. Our portfolio currently addresses problems related to small farms, organic products, youth, nutrition, minorities, and rural communities. We are committed to continue to provide research results that will improve the lives of all of our population.

3. How will the planned programs describe the expected outcomes and impacts?

The planned program will describe the outcomes and impacts in a number of ways. Initially, we will use three indicators to measure outcomes: Patents (as the single required outcome indicator), number of publications, and graduate students trained (degrees granted) based on the project portfolio. Since we have not previously tracked patents specifically tied to Hatch support, this measure is somewhat more tentative than the other two that we have monitored. We also believe that patent disclosures might be a better short term indicator, since the patent process may not come to completion until well after the active research project has terminated. This is something we intend to monitor as a possible future indicator of effort.

We are hopeful that the “One Solution” reporting system under development will allow us flexibility to add outcomes specific to our Plan of Work. Inclusion of such flexible fields would greatly help us track indicators on an annual basis as part of our required reporting process.

We will continue to develop impact statements on projects that we feel have contributed not only to the advancement of the Knowledge Areas, but which have had a greater impact in terms of Extension programming or societal benefits.

4. How will the planned programs result in improved program effectiveness and/or efficiency?

The planned program results in improved program effectiveness and/or efficiency in that it is annually being reviewed, and being re-directed to issues that are newly emerged or considered most relevant to national and state needs. As part of the merit review and application process that is used, past output performance by the faculty/scientists is considered. Evidence of productivity is an important consideration in reviewing and rating projects for approval. The annual proposal process also allows for updating stakeholder input on a regular basis. These changes are published in the call for proposals and are presented to the proposal review panel for use in making recommendations on project proposals.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to selected individuals from general public
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to traditional stakeholder groups

Brief explanation.

Stakeholder Input

Stakeholders' input for the development and conduct of research relating to state needs is accomplished in a tiered system. Many departments, centers, and institutes maintain advisory committees that meet periodically with researchers in the units. Departments convey these inputs to the Dean's office. The College of Agricultural and Life Sciences has a central Advisory Board that meets twice a year with the Dean and Associate Deans. Members of the committee are selected from a wide range of producers, industry, consumer, environmental groups and state agencies. This Board not only advises on research and outreach needs, but also advises on contacts for constituency groups and individuals.

In addition to advisory groups, the Dean of CALS periodically meets with focus groups representing organizations within Wisconsin in a series of meetings called CALS Roundtables. Focus groups include traditional and non-traditional stakeholders. Input from these stakeholders is used to help highlight areas of research need. A listing of these focus groups follows at the end of this section. The primary goal of the CALS Roundtable is to improve communication between the College and the people it serves and to provide feedback to the College. The Roundtable provides periodic opportunities for leaders of user groups to interact informally with CALS administration and faculty to discuss: a) user group needs and opportunities; b) current CALS programs and program proposals and their effectiveness; and c) ways to increase cooperation among user groups, the university, and state and federal agencies. Discussions focus primarily on issues related to CALS research, education and extension/outreach programs.

Focus Group List:

- •General Agriculture
- •Food Processing and Marketing
- •Animal Agriculture
- •Plant Groups
- •Environmental and Natural Resources
- •Green and Forestry
- •Biotechnology
- •Sustainable and Organic Food Produces
- •Consumer and Non-Traditional Groups

The Dean's and Director's office also tries to participate in as many public or stakeholder sponsored meeting/field days for public input. Normally, we would participate in 50-100 of these per year, including field days at our Agricultural Research Stations.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups

Brief explanation.

Methods to Identify Individuals and Groups As indicated earlier in Question 1 of this section, UW–Madison relies heavily on advisory boards to help identify stakeholders. The College of Agricultural and Life Sciences through its Dean, Associate Deans, and Assistant Dean for Communications maintains a close relationship with stakeholders and through these face-to-face interactions obtains information on needs and on other potential stakeholders. Departments, department chairs and faculty can also recommend contacts.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder individuals
- Meeting with invited selected individuals from the general public
- Meeting with traditional Stakeholder groups
- Meeting specifically with non-traditional individuals
- Meeting specifically with non-traditional groups
- Meeting with the general public (open meeting advertised to all)

Brief explanation

Methods of Stakeholder Input

Methods of collecting stakeholder input vary depending upon the type of meeting or activity that the input process is organized around. Most generally this involves personal contact with someone from the UW-Madison WAES/CALS Administrative leadership group meeting with a traditional or non-traditional stakeholder group or individual or meetings that are open to the general public or selected individuals. For example, in August 2007, the WAES/CALS Administration hosted a listening session at the West Madison Agricultural Research Station for input on the bio-energy/bio-economy initiatives that are emerging. Participants were invited from traditional agricultural/energy stakeholders such as the Farm Bureau, Farmers Union, commodity groups and various Wisconsin energy utilities. Also invited were representatives from non-traditional stakeholder groups such as the Audubon Society, Nature Conservatory and other environmental social interest groups. All groups or individual participants were asked to provide input to a broad set of questions related to the bio-energy/bio-economy and were given the opportunity to provide a general statement of interest.

Other examples of such face-to-face stakeholder contacts include:

1) Meeting with commodity related groups such as the potato and vegetable growers, cranberry producers, the grazing conference, specialty and bulk cheese producers, Wisconsin Swine Producers, Wisconsin Cattleman's Association, Farm Bureau, Federation of Cooperatives, and various dairy related groups. This is not meant to be inclusive, as a full list of contacts is given in our Annual Report.

2) Input from participants at UW-Madison/CALS Agricultural field day events. These field days, whenever possible, are attended by representatives of the WAES/CALS team to interact with participants and solicit input.

3) We routinely meet with representatives of traditional and non-traditional stakeholder groups or individuals with specific personal interests. Numerous examples are cited in our Annual reports.

3. A statement of how the input will be considered

- To Set Priorities
- In the Staff Hiring Process
- To Identify Emerging Issues
- In the Budget Process
- Redirect Research Programs

Brief explanation.

Stakeholders Input

Stakeholders input is used by the UW–Madison, College of Agricultural and Life Sciences in a number of ways. It is used in helping establish strategic and shorter term action plans, in establishing budget priorities and in establishing direction of our teaching, outreach and research programs. This would include reallocation of resources to emerging or critical areas, identification of those emerging areas, and setting priorities among programs and research areas.

As described earlier in the program overview, the CALS administrative team discusses stakeholder input as part of a series of regularly scheduled meetings of the administrative group. Priorities are reviewed, discussed, and updated based on stakeholder input. These priorities are published and distributed annually as part of the Call for Proposals for our Hatch research program.

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Wisconsin Competitive Research Program

V(A). Planned Program (Summary)

Program #1

1. Name of the Planned Program

Wisconsin Competitive Research Program

2. Brief summary about Planned Program

Wisconsin Competitive Research Program

The Wisconsin Competitive Research Program is an evolutionary program that attempts to fund the best science relative to national, regional and state needs and priorities. The program process reallocates approximately 25% of the Hatch portfolio each year based upon a competitive process among our faculty. The program uses the national goals and emphasis areas established in the REE and CSREES agency strategic plans and areas of identified research needs for Wisconsin as priority areas for the process. This process allows us to continually update our portfolio because projects are generally approved for 3-4 years (some multistate projects are awarded a 5 year approval). At the end of each project, faculty must re-apply documenting not only need, relevance to program priorities (including integrated activity and multistate programs), and scientific merit, but also productivity of the project to date.

Narrative: We are unable to provide the information here due to the trucation of text. We will provide as a separate document, if requested.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources			3%	
102	Soil, Plant, Water, Nutrient Relationships			6%	
123	Management and Sustainability of Forest Resources			12%	
133	Pollution Prevention and Mitigation			4%	
201	Plant Genome, Genetics, and Genetic Mechanisms			8%	
202	Plant Genetic Resources			2%	
205	Plant Management Systems			4%	
206	Basic Plant Biology			5%	
211	Insects, Mites, and Other Arthropods Affecting Plants			6%	
212	Pathogens and Nematodes Affecting Plants			8%	
301	Reproductive Performance of Animals			5%	
302	Nutrient Utilization in Animals			5%	
304	Animal Genome			5%	
305	Animal Physiological Processes			4%	
311	Animal Diseases			6%	

501	New and Improved Food Processing Technologies			4%	
502	New and Improved Food Products			2%	
604	Marketing and Distribution Practices			3%	
702	Requirements and Function of Nutrients and Other Food Component			5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Pa			3%	
	Total			100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Current goals and priorities include the following national goals:

1) Enhance Economic Opportunities for Agricultural Producers. Empower families and communities to address the economic and social challenges through research-based information and education.

2) Support Increased Economic Opportunities and Improved Quality of Life in Rural America. Enhance environmental quality through better understanding of, and building on, agriculture and forestry's complex links with soil, water, air and biotic resources.

3) Enhance Protection and Safety of the Nation's Agriculture and Food Supply. Ensure a safe and adequate food and fiber supply through improved science-based detection, surveillance, prevention, and education.

4) Improve the Nation's Nutrition and Health. Enable people to make health-promoting dietary choices through nutrition education, research, and development of more nutritious foods.

5) Protect and Enhance the Nation's Natural Resource Base and Environment. Empower the agricultural system with knowledge to improve competitiveness in domestic production, processing, and marketing through research and education.

Areas of identified research need for Wisconsin are also to be given priority. These are updated annually based upon feedback from stakeholders. These priorities include:

Within these national goals, states are asked to draw on stakeholder input to help direct use of formula funding. In Wisconsin, faculty meet regularly with a number of college and departmental advisory groups, commodity organizations, state agencies, consumer groups, and private citizens. Input from these stakeholders, and from those performing the research, is beneficial to assist in highlighting areas of research need. Department chairs are asked to provide a small number of research topics from each unit of CALS for use in Hatch and McIntire-Stennis call for proposals. The following is a compilation of common themes reviewed and updated annually. The list below is provided to draw attention to needs currently of interest within the state.

1) Mechanisms of pest and pathogen resistance and safe and effective control, with minimum effects on environmental quality and human health.

2) Effects of change in global climate, population pressures, or public policy on agricultural production, environmental resources, ecosystem management, and future land uses.

3) Identification of socioeconomic or other forces that shape the viability of Wisconsin industries and employment including agriculture, bio-based industry, forestry, wildlife management, recreation, and other land uses.

4) Research on food safety, nutritional health, environmental protection, and biotechnology and on providing information on dietary choices, lifestyle and community decisions.

5) Sustainable agricultural and forestry production and processing systems that provide improved food safety and security, environmental protection, economically viable communities, protection of public goods, and human well-being. This need requires an understanding of basic life processes in order to manage biotic systems for human use.

2. Scope of the Program

- In-State Research
- Multistate Integrated Research and Extension
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The following assumptions are made for this program:

1. The greatest advances in addressing national, regional, and state needs can be made by competitively soliciting the best science and research.

2. Graduate training efforts funded through the UW-Madison competitive Hatch competition will provide a sound basis for the future of the Hatch related sciences and issues.

3. Funding of the program will continue in a stable manner.

2. Ultimate goal(s) of this Program

1. To address national and state issues with the science of highest quality and greatest potential to have an effect in addressing the issues relevant to the Hatch mission.

2. Train graduate students to build the human resources needed to address current and future problems relevant to the Hatch mission.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2009	0.0	0.0	156.0	0.0
2010	0.0	0.0	154.0	0.0
2011	0.0	0.0	154.0	0.0
2012	0.0	0.0	154.0	0.0
2013	0.0	0.0	154.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

As a research driven activity, this state project is made up of approximately 160 individual research projects addressing national, regional and state needs, and includes both multi-state and integrated activity.

As a research report, we are not reporting activities for the University of Wisconsin-Extension. However, we do integrated activity as part of our Hatch and other Formula Funded programs. A variety of methods are used to accomplish these efforts.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	**Indirect Methods**
• Other 1 (Field Days) • One-on-One Intervention • Demonstrations • Workshop • Group Discussion	• Web sites • Other 1 (Press Releases)

3. Description of targeted audience

As a research report, we are not reporting activities for the University of Wisconsin-Extension. Integrated activity for our Hatch and other Formula Grant programs target a broad group of stakeholder audiences in agricultural, natural resources, and the public. Examples can be seen in our stakeholder information provided elsewhere in this report.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	0	0	0	0
2010	0	0	0	0
2011	0	0	0	0
2012	0	0	0	0
2013	0	0	0	0

2. (Standard Research Target) Number of Patent Applications Submitted

Expected Patent Applications

2009 : 4 **2010 :** 4 **2011 :** 4 **2012 :** 4 **2013 :** 4

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	150	0	0
2010	150	0	0
2011	150	0	0
2012	150	0	0
2013	150	0	0

V(H). State Defined Outputs

1. Output Target

- Output measures for this project include patents, graduate students trained, and publications. While we have data on patents with federal support, we have not previously tracked patents specifically linked to HATCH support. This estimated output does not have the same level of confidence as the others measures and will be refined as we gain experience with this measure for HATCH supported work. Graduate Students Trained (Degrees Granted):

2009 : 55 **2010 :** 55 **2011 :** 50 **2012 :** 50 **2013 :** 50

V(I). State Defined Outcome

O. No	Outcome Name
1	Outcome measures for this work are both qualitative and quantitative. We will rely on feedback from stakeholder groups, advisory boards, and individual constituents, as well as from UW Extension teams on the relevance, importance and impact of our research program. The output measures listed earlier will also serve as outcome measures in that patents graduate degrees, and publications all include an element of critical review and assessment of uniqueness, originality, contribution to the science and knowledge base, or other performance criteria. Finally, we will use the Thomson ISI Essential Science Indicator for agricultural science as a measure of impact of our research program. Our target for this outcome measure is to be ranked in the top 5 institutions in the United States. We will continue to develop impact statements for individual projects which have shown exemplary and significant impact. Publications:

Outcome #1

1. Outcome Target

Outcome measures for this work are both qualitative and quantitative. We will rely on feedback from stakeholder groups, advisory boards, and individual constituents, as well as from UW Extension teams on the relevance, importance and impact of our research program. The output measures listed earlier will also serve as outcome measures in that patents graduate degrees, and publications all include an element of critical review and assessment of uniqueness, originality, contribution to the science and knowledge base, or other performance criteria. Finally, we will use the Thomson ISI Essential Science Indicator for agricultural science as a measure of impact of our research program. Our target for this outcome measure is to be ranked in the top 5 institutions in the United States. We will continue to develop impact statements for individual projects which have shown exemplary and significant impact. Publications:

2. Outcome Type : Change in Condition Outcome Measure

2009 : 150	**2010 :** 150	**2011 :** 150	**2012 :** 150	**2013 :** 150

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 311 - Animal Diseases
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 604 - Marketing and Distribution Practices
- 702 - Requirements and Function of Nutrients and Other Food Components
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Public Policy changes
- Natural Disasters (drought,weather extremes,etc.)
- Competing Public priorities
- Government Regulations
- Appropriations changes

Description

A variety of factors could affect the outcomes of this project including those listed above. However, the breadth of this program makes it unlikely that that the outputs and outcomes would be completely disrupted unless there was some major natural, economic, or public policy disruption. A major change in Federal policy or appropriation affecting the Hatch program could affect our ability to meet our outcomes. The UW-Madison is implementing a policy change regarding tuition remission. Hatch and other formula funds have previously been exempted in the UW-System, but will no longer be exempt in the next few years. Since these fund do not allow tuition remission, could force us to re-evaluate some alternative to meeting our Hatch mission with fewer graduate students being trained. However, we recently have re-affirmed this as a priority for this program.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- During (during program)
- Retrospective (post program)

Description

Evaluation studies planned include qualitative and quantitative methodology. We have already described a number of methods used to solicit stakeholder input. At the time input is being sought from these groups, boards, and individuals, we are also soliciting feedback on the pertinence and effectiveness of our current programs. This information is primarily qualitative, but provides important feedback on the program. Similar input will be sought from UW Extension's issue oriented teams.

In the competitive reapplication process that is for projects, project productivity and impact are also evaluated. This occurs every 2-4 years, and is an important factor in whether a scientist's project will be re-approved. When new projects are proposed, past project performance is also a significant consideration.

Overall project success will be evaluated by monitoring the number of graduate students trained, peer reviewed publications, and an impact factor based of our research based on the ISI Essential Science Indicators. While this is an indicator of our overall CALS research program, we believe that it is also representative of our Hatch research component.

2. Data Collection Methods

- Portfolio Reviews
- Sampling
- Structured
- Unstructured

Description

Data collection will include structured and unstructured interview information from stakeholder groups, advisory boards, and key individual constituents. We will ask Extension to solicit information annually from their issue oriented teams. Data will be compiled annually on patents, graduate students trained, and number of publications. The Thomson ISI Essential Science Indicators will be monitored annually to assess impact of our research program.